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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/575,489	04/12/2006	Hiroshi Fukshima	P29715	1539

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EXAMINER	
YANG, MINCHUL	
ART UNIT	PAPER NUMBER
2891	

NOTIFICATION DATE	DELIVERY MODE
05/07/2008	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary	Application No.	Applicant(s)	
	10/575,489	FUKSHIMA ET AL.	
	Examiner	Art Unit	
	Minchul Yang	2891	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *01/14/08*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,2,4-6,8-10,12 and 14* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-2, 4-6, 8-10, 12, 14* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

Detailed Action

1. Please Note: This case has been assigned to a new examiner, Minchul Yang. Applicant is advised to note the revised contact information in the Contact Information section of this Office Action.

2. Claims 3, 7, 11, and 13 are cancelled.

Information Disclosure Statement

3. The information disclosure statement filed 01/14/08 fails to comply with 37 CFR 1.98(a)(1), which requires the following: (1) a list of all patents, publications, applications, or other information submitted for consideration by the Office; (2) U.S. patents and U.S. patent application publications listed in a section separately from citations of other documents; (3) the application number of the application in which the information disclosure statement is being submitted on each page of the list; (4) a column that provides a blank space next to each document to be considered, for the examiner's initials; and (5) a heading that clearly indicates that the list is an information disclosure statement. The information disclosure statement has been placed in the application file, but the information referred to therein has not been considered.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in

> section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

6. Claims 1-2, 4-6, 10, and 14 are rejected under 35 U.S.C. 103(a) as being anticipated by Okazaki (US Patent 6495862), in view of Poicus (US Patent 6987613) and Babich (US Pub. 2005/0064322).

(a) Okazaki discloses a method of making an LED, comprising steps of:

Regarding claim(s) 1: forming a transfer layer on at least a part of the transparent crystal substrate or the light-emitting layer (Col. 5, lines 31 -35), softening or setting said transfer layer upon supplying an energy thereto (Col. 5, lines 43-46); forming a minute unevenness structure for preventing multiple reflection based on the minute unevenness structure transferred to the transfer layer (Col. 5, lines 47-52);

Regarding claim(s) 2: separating the transparent crystal substrate from the light-emitting layer after a substrate bearing layer is formed on a surface of the light-emitting layer where electrodes are to be formed" (Col. 13, lines 1-3).

(b) Regarding claim(s) 1, Okazaki discloses the features previously outlined, but does not

expressly disclose the following limitation(s): pressing a mold formed with a minute unevenness structure against the transfer layer to transfer the minute unevenness structure to an outer surface of the transfer layer.

However, Poicus teaches a method of making an LED comprising a step of pressing a mold formed with a minute unevenness structure (the stamping block 70 in figure 9) against the transfer layer to transfer the minute unevenness structure to an outer surface of the transfer layer (figure 9 and Col. 8, lines 10-51), for the benefit of having greater flexibility in designing the contours of the unevenness structure to include Fresnel lenses or holographic diffusers (Col. 3, lines 2-13) as well as to improve light extraction. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the process of Okazaki with the mold of Poicus for the benefit of having had greater flexibility in designing the contours of the unevenness structure to include Fresnel lenses or holographic diffusers as well as well as to improve light extraction.

(c) Regarding claim(s) 1, Okazaki in view of Poicus teach the features previously outlined, but do not expressly teach the following limitation(s): a pressing pressure of the mold is 5 MPa or higher and 150 MPa or lower. However, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use a pressing pressure of 5 MPa or higher and 150 MPa or lower in the method of Okazaki in view of Poicus, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or working ranges involves only routine skill in the art. *In* re Aller, *105 USPQ 233.*

(c) Regarding claim(s) 1, Okazaki in view of Poicus teach the features previously outlined, but do not expressly teach the following limitation(s): dry etching the transfer layer

with a chlorine gas using the transfer layer as a resist mask to form the minute unevenness structure for preventing the multiple reflection in the transparent crystal substrate or the light-emitting layer.

However, Babich teaches a method of forming a minute unevenness structure for preventing the multiple reflections comprising a step of dry etching a transfer layer with a chlorine gas using the transfer layer as a resist mask to form the minute unevenness structure for preventing the multiple reflections in the transparent crystal substrate or the light-emitting layer (0030-0033, 0049, and 0074). Babich also teaches that it was well known in the art to use silicon organic solvent materials, (TEOS) as a hard mask for dry etching (0032). Moreover, Okazaki teaches that the resist pattern 30 is dry-etched by reactive ion etching (RIE) (note that chlorine is a commonly used gas in RIE: see, e.g., Babich, 0049). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the hard mask of Babich to the minute unevenness structure of Okazaki in view of Poicus for the benefit of etching a semiconductor material under extreme conditions.

(d) Regarding claim(s) 4, Okazaki in view of Poicus and Babich teach the claimed invention except for, "a mold having an upper flat portion to be located near the bottoms of the minute unevenness structure for preventing the multiple reflection and a lower flat portion to be located at a position lowered from the upper flat portion by about the thickness of the upper semiconductor layer of the light-emitting layer against the transfer layer to transfer an upper flat portion and a lower flat portion together with the minute unevenness structure to the transfer layer" which has no patentable weight because the recited structural limitation must affect the

method in a manipulative sense, and not amount to the mere claiming of a use of a particular structure. Ex parte Pfeiffer, 1962 C.D. 408 (1961).

Poicus discloses the claimed invention except for, "forming electrode-forming portions by etching the upper and lower semiconductor layers of the light-emitting layer when dry etching is carried out using the transfer layer as a resist mask." It would have been obvious to one of ordinary skill in the art at the time the invention was made to place electrodes at either end of the active layer, since it has been held that rearranging parts of an invention involves only routine skill in the art. In re Japikse, 86 USPQ 70.

(e) Regarding claim(s) 5 and 10, Okazaki in view of Poicus and Babich teach the claimed invention except for, "adjusting a selection ratio of the etching speed of the light-emitting layer to that of the resist from twofold to fourfold". It would have been obvious to one of ordinary skill in the art at the time the invention was made to adjust a selection ratio of the etching speed of the light-emitting layer to that of the resist from twofold to fourfold, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or working ranges involves only routine skill in the art. *In* re Aller, *105 USPQ 233.*

(f) Regarding claim(s) 6 and 14, Okazaki in view of Poicus and Babich teach the claimed invention except for "applying the silicon organic solvent by potting or spray coating". It would have been obvious to one of ordinary skill in the art at the time the invention was made to apply the silicon organic solvent by potting or spray coating, since it was known in the art that TEOS may be applied by potting or spray coating.

7. Claims 8-9 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Okazaki in view of Poicus and Babich, as applied to the claims above, and further in view of Holman (US Pub. 2004/0080938).

(a) Regarding claim(s) 8, Okazaki in view of Poicus and Babich teach the features previously outlined, but do not expressly teach the following limitation(s): “unevenness structure larger than the minute unevenness structure on the minute unevenness structure of the light-emitting layer”. However, Holman teaches, "unevenness structure larger than the minute unevenness structure on the minute unevenness structure of the light-emitting layer" for the benefit of well defined and controllable illumination (0038, and Fig. 3). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the unevenness structures of Holman with the method of Okazaki in view of Poicus and Babich for the benefit of well defined and controllable illumination.

(b) Regarding claim(s) 9, Okazaki in view of Poicus, Babich, and Holman teach the features previously outlined. Poicus further discloses the unevenness structure has the shape of a prism or a microlens (Fig. 9).

(c) Regarding claim(s) 12, Okazaki in view of Poicus and Babich teach the features previously outlined, but do not expressly teach, "unevenness structure larger than the minute unevenness structure on the minute unevenness structure of the light-emitting layer". However, Holman teaches, "unevenness structure larger than the minute unevenness structure on the minute unevenness structure of the light-emitting layer" for the benefit of well defined and controllable illumination (0038-0039, and Fig. 3). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the unevenness

structures of Holman with the method of Okazaki in view of Poicus and Babich for the benefit of well defined and controllable illumination.

Response to Arguments

8. Applicant's arguments filed on 1/14/2008 have been fully considered but they are not persuasive for the reasons set forth hereinabove.

Applicant argues that the Examiner does not assert and has not provided any factual evidence which reasonably shows that adjusting the pressure ranges and the ratio of the etching speeds achieve a recognized result. However, it was well known in the art that a pressing pressure of a mold is one of parameters that determine a final structure of a resist in terms of pitch-to-pitch distances, height distributions, and regularities of the molded pattern in the resist. For instance, if the pressing pressure is too low, the molded pattern of the resist would have a less sharpness than that of the mold. If the pressing pressure is too high, the resist would be at risk of damage.

It was also well known in the art that a selection ratio of the etching speed between a resist and an underlying layer is one of parameters that determine a final structure of the etched underlying layer in terms of pitch-to-pitch distances, height distributions, and regularities of the etched pattern in the underlying layer. For instance, if the etching speed of the resist is higher than that of the underlying layer, the etched pattern of the underlying layer would have a less sharpness than that of the pattern of the resist.

Conclusion

9. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Minchul Yang whose telephone number is (571) 270-1750. The examiner can normally be reached on Monday through Friday 7:30 AM - 5:00 PM E.S.T..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bill Baumeister can be reached on (571) 272 -1722. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR

system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

MY /M. Y./

Examiner, Art Unit 2891

/Matthew C. Landau/

Primary Examiner, Art Unit 2815